

REMARKS

Claims 1-18 are all the claims presently pending in the application. Claims 1-8 have been merely editorially amended and have not been substantively amended to more particularly define the invention. Claims 9-18 have been added to claim additional features of the invention.

It is noted that the claims amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims, or for any statutory requirements of patentability. Further Applicants specifically state that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Applicants gratefully appreciate the Examiner's indication that claim 4 would be allowable if written in independent form. However, Applicants submit that all of claims 1-18 are allowable.

Additionally, Applicants point out to the Examiner that claim 8 is merely rejected under 35 U.S.C. § 112, second paragraph, as being indefinite, and is not subject to a prior art based rejection. Applicants point out to the Examiner that MPEP 2173.06 states "where the degree of uncertainty is not great, and where the claim is subject to more than one interpretation and at least one interpretation would render the claim unpatentable over the prior art, an appropriate course of action would be for the examiner to enter two rejections: (A) a rejection based on indefiniteness under 35 U.S.C. 112, second paragraph; and (B) a rejection over the prior art based on the interpretation of the claims which renders the prior art applicable".

The Examiner has merely rejected claim 8 as being indefinite because the limitation "the second layer forming step" lacks proper antecedent basis. Therefore, "the degree of uncertainty" is clearly not "great" in claim 8. Therefore, the Examiner should have issued a

prior art based rejection. Thus, because the Examiner has failed to include a prior art based rejection of claim 8, Applicants assume that claim 8 would be allowable if amended to overcome the 35 U.S.C. § 112, second paragraph, rejection.

If, however, the Examiner intended for claim 8 to be rejected over the prior art, Applicants respectfully request that the Examiner provide a basis for such rejection in his next Non-Final Office Action.

Claim 8 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 1-3 and 5-7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shibata et al. (U.S. Patent No. 6,824,610; hereinafter “Shibata”).

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

The claimed invention (e.g., as defined by exemplary claim 1) is directed to a method of producing a Group III nitride compound semiconductor substrate. The method includes forming a first Group III nitride compound semiconductor layer by a halide vapor-phase epitaxy method on a silicon (Si) substrate, and removing substantially the whole of the silicon substrate by etching a rear surface of the silicon substrate.

Conventional semiconductor devices use a substrate for epitaxial growth of a Group III nitride compound semiconductor. A Group III nitride compound semiconductor substrate having a thickness allowed to be handled is not conventionally available. Therefore, an inexpensive substrate, other than a Group III nitride compound semiconductor substrate is used. Typically, however, the inexpensive substrates used have a largely different lattice constant from the Group III nitride compound semiconductor layer, which may result in the formation of cracks. Additionally, there is a large difference in the thermal expansion coefficient between the substrate and the Group III nitride compound semiconductor layer,

which results in a large amount of heat stress.

The claimed invention of exemplary claim 1, on the other hand, provides a method of producing a Group III nitride compound semiconductor substrate including removing substantially the whole of the silicon substrate by etching a rear surface of the silicon substrate (e.g., see Application at page 3, line 24 through page 4, line 8). This feature is important for relaxing the stress between the silicon substrate and the first Group III nitride compound semiconductor so that the stress is substantially absent (see Application at page 6, lines 5-18).

II. THE 35 U.S.C. 112, SECOND PARAGRAPH, REJECTION

The Examiner has rejected claim 8 under 35 U.S.C. 112, second paragraph, as being indefinite. Specifically, the Examiner alleges that the phrase “the second layer forming step” lacks proper antecedent basis. Applicants have amended claim 8 to overcome the Examiner’s rejection.

Specifically, Applicants have amended claim 8 to delete the phrase “whereas the second forming step is carried out at a temperature of not lower than 1000°C”.

Applicants submit that the claim amendments render the Examiner’s rejection moot. Therefore, Applicants respectfully request the Examiner to withdraw this rejection.

III. THE PRIOR ART REJECTION

The Examiner alleges that the claimed invention of claims 1-3 and 5-7 would have been obvious in view of Shibata. Applicants submit, however, that Shibata does not teach or suggest (nor make obvious) each and every feature of the claimed invention.

That is, Shibata does not teach or suggest “*removing substantially the whole of said silicon substrate by etching a rear surface of said silicon substrate*” as recited in claim 1.

The Examiner attempts to rely on Figure 5 and Example 9 of Shibata to support his allegation. The Examiner, however, is clearly incorrect.

That is, nowhere in this figure nor this example (nor anywhere else for that matter) does Shibata teach or suggest removing substantially the whole of the silicon substrate by etching a rear surface of the silicon substrate. Indeed, Shibata merely teaches separating a silicon substrate from a GaN layer.

Shibata merely teaches forming a silver film on a front surface of a silicon substrate. An AlN film and a GaN film are then formed above the silver film. The silver film is then removed by etching to separate the silicon substrate and the GaN layer (see Shibata at column 12, lines 30-63; Example 9).

In contrast, the claimed invention may remove the silicon substrate by etching a rear surface of the silicon substrate. Shibata does not even mention etching the silicon substrate, let alone teach or suggest etching the rear surface of the silicon substrate to substantially remove the silicon substrate. That is, as indicated above, Shibata teaches etching the silver film to separate the silicon substrate. The silicon substrate itself is not etched in Shibata. Therefore, Shibata fails to teach or suggest each and every feature of the claimed invention.

Therefore, Applicants submit that Shibata does not teach or suggest (nor make obvious) each and every feature of the claimed invention. Therefore, the Examiner is respectfully requested to reconsider and withdraw this rejection.

IV. NEW CLAIMS

New claims 9-18 have been added to provide more varied protection for the claimed invention and to claim additional features of the invention. These claims are independently patentable because of the novel features recited therein.

Applicants submit that new claims 9-18 are patentable over any combination of the applied references at least for analogous reasons to those set forth above with respect to claims 1-8.

IV. FORMAL MATTERS AND CONCLUSION

In view of the foregoing, Applicants submit that claims 1-18, all of the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,



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